STATEMENT OF BASIS
CLASS IIR MAJOR PERMIT MODIFICATION
RESOLUTE NATURAL RESOURCES COMPANY

Major Modification
UIC Permit NN295000009
Ratherford Unit Area Permit
San Juan County, Utah
Navajo Nation

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BACKGROUND INFORMATION

Resolute Natural Resources Company, "permittee" is applying for a major modification to the existing permit to enlarge the authorized injection interval in the Ratherford Unit Class IIR injection wells, located in the Greater Aneth Oil Field, San Juan County, Utah on Navajo Nation trust lands. The permittee has applied for a permit modification to allow for major modifications to the well construction and injection intervals to allow drilling uncased boreholes through the lower Honaker Trail Formation and the Ismay and Gothic Mesa members of the Paradox Formation in the process of drilling horizontal boreholes in the Desert Creek member of the Paradox Formation. The permit currently authorizes injection only into the Desert Creek member. Drilling horizontally into the Desert Creek member requires the initiation of directional drilling in the lower Honaker Trail Formation, through the Ismay and Gothic Mesa members, before the borehole reaches a horizontal orientation in the Desert Creek member. Because the directionally drilled horizontal boreholes are not cased or cemented, the open hole intervals in the Honaker Trail and Paradox Formations will be open to injection fluids and pressures. This modification of the well construction will enlarge the authorized injection interval to include the lower Honaker Trail Formation, and the Ismay and Gothic Mesa members, in addition to the Desert Creek member, of the Paradox Formation.

Underground sources of drinking water (USDWs) will not be endangered by this modification since the lowermost USDW is located more than 3,000 feet above the Honaker Trail Formation and is separated and isolated from the injection zone by approximately 3,000 feet of confining strata composed of essentially impermeable layers of shale, anhydrite, carbonates, and siltstones.

In addition to the above changes, EPA has added minor modifications to the mechanical integrity testing procedures in Part II.C.1 and monitoring requirements in Part II.D.1 of the permit, as described below. These modifications will increase the level of protection of USDWs.

The EPA has decided to approve this permit modification, pending public review and comment, and is now issuing a Draft Permit Modification. The Final Permit was issued on May 31, 1995 for a period of twenty (20) years unless the permit is terminated or modified for reasonable cause (40 CFR §§144.39, 144.40, and 144.41). The permit will be reviewed by EPA every five years. The modifications described above are the only modifications requested by the permittee and required by EPA and are the only matters that are open for public review and comment in this permit action.

This Statement of Basis describes the specific permit conditions that will be affected by the permit modification and the basis for approval of the modifications under authority of the Underground Injection Control (UIC) regulations at 40 CFR 144.39, promulgated for Class II injection wells on Navajo Nation lands, and the UIC provisions of the Safe Drinking Water Act.

PART II. SPECIFIC PERMIT CONDITIONS

SECTION A. WELL CONSTRUCTION

1. Casing and Cementing

   Windows will be opened in the long string casing in the lower Honaker Trail Formation to initiate drilling of horizontal boreholes through the lower Honaker Trail and Paradox Formations into the Desert Creek member of the Paradox Formation. The openings will be located at a depth no higher than 129 feet above the Ismay member of the Paradox Formation. Wellbore schematics of a typical horizontal injection well and vertical injection well in the Ratherford Unit are included in the Appendix D of the permit.

SECTION B. CORRECTIVE ACTION

No corrective action is required of the permittee because all of the wells within the Area of Review that penetrate the injection interval were properly constructed or plugged and abandoned in accordance with UIC requirements. Corrective action may be required in the future if it is determined that fluid movement into USDWs is occurring or may occur in wells that penetrate the injection zone.

SECTION C. WELL OPERATION

1. Mechanical Integrity

(a)(ii) The bradenhead valve will be opened and fluid pressure and content shall be monitored and recorded before and during the annular pressure test. This procedure is usually performed during mechanical integrity tests (MITs), and is added here to clarify that it is a permit requirement and to ensure that USDWs are not endangered by excessive fluid pressure and the presence of saline waters and/or hydrocarbons in the casing/wellbore annulus. The results of bradenhead monitoring may indicate a mechanical integrity failure, depending on EPA assessment of the MIT and well construction data.

2. Injection Intervals

The injection interval is modified to include the lower 129 feet of the Honaker Trail Formation and the Paradox Formation, through the Desert Creek Member. Horizontal boreholes in the Desert Creek Formation will not extent beyond the Ratherford Unit boundaries. Drilling horizontally into the Desert Creek member requires the initiation of directional drilling in the lower Honaker Trail Formation, through the Ismay and Gothic Mesa members, before the borehole reaches a horizontal orientation in the Desert Creek member. Because the directionally drilled horizontal boreholes are not cased or cemented, the open hole intervals in the Honaker Trail and Paradox Formations will be open to injection fluids and pressures. The Ismay and Desert Creek members of the Paradox Formation are oil bearing zones in the Ratherford Unit and both are open in many of the existing injection and production wells in the Unit. The lower Honaker Trail Formation and Gothic Mesa member are non-productive and should receive negligible quantities of injection fluids in the open hole sections of horizontal wells. The potential for migration of formation fluids out of the injection zone and into USDWs will be limited by the fact that the lowermost USDW is over 3,000 feet above the modified injection interval and is isolated from the injection zone by confining strata approximately 3,000 feet in thickness

SECTION D. MONITORING, RECORD KEEPING, AND REPORTING OF RESULTS

1(a)(i) Monitoring of the viscosity is added to the other requirements for monitoring of injection fluid properties. The viscosity of the injected fluid is one of several parameters needed in the evaluation of reservoir pressure behavior, permeability, and related characteristics of the injection zone.

1(c) In addition to the existing monitoring requirements, average fluid levels and/or reservoir pressures will be measured and reported to EPA on an annual basis in order to monitor pressure behavior in the injection zone.